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## **Genes encoding xylan and beta-glucan hydrolysing enzymes in *Bacillus subtilis*: characterization, mapping and construction of strains deficient in lichenase, cellulase and xylanase.**

**Wolf M, Geczi A, Simon O, Borrius R.**

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The gene encoding extracellular xylanase (*xynA*) was amplified as a 770 bp DNA fragment from *Bacillus subtilis* 168 chromosomal DNA by PCR. The genes encoding endo-beta-1,4-glucanase (*eglS*) and endo-beta-1,3-1,4-glucanase (*bglS*) were isolated from a genomic library of *B. subtilis* 168. The sequences of *xynA* and *eglS* were identical to those of the xylanase and cellulase genes from *B. subtilis* PAP115. Integrative plasmids containing DNA fragments with deletions in the coding region of the genes were constructed and used to replace the chromosomal *eglS*, *bglS* and *xynA* genes of *B. subtilis* 168. Strains without any detectable activity against xylan (Xyn-), carboxymethylcellulose (Egl-) or mixed linked beta-1,3-1,4-glucan (Egl- Bgl-) were obtained. The genes were mapped at 170 degrees (*eglS*), 175 degrees (*xynA*) and 340 degrees (*bglS*) on the *B. subtilis* chromosome.

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